Design Consultants, Inc.

120 Middlesex Avenue Somerville, MA 02145 (617) 776-3350

MEMORANDUM

DCI JOB NO. 2012-016

TO:

Terry Smith, Traffic Eng. Somerville Traffic and Parking Department

FROM:

William D. Carlson,

Senior Transportation Engineer

SUBJECT:

Traffic Impact Assessment

Petra Somerville LLC - Rock Climbing/Fitness Center

10 Tyler Street, a/k/a 28 Park Street

Somerville, MA

DATE:

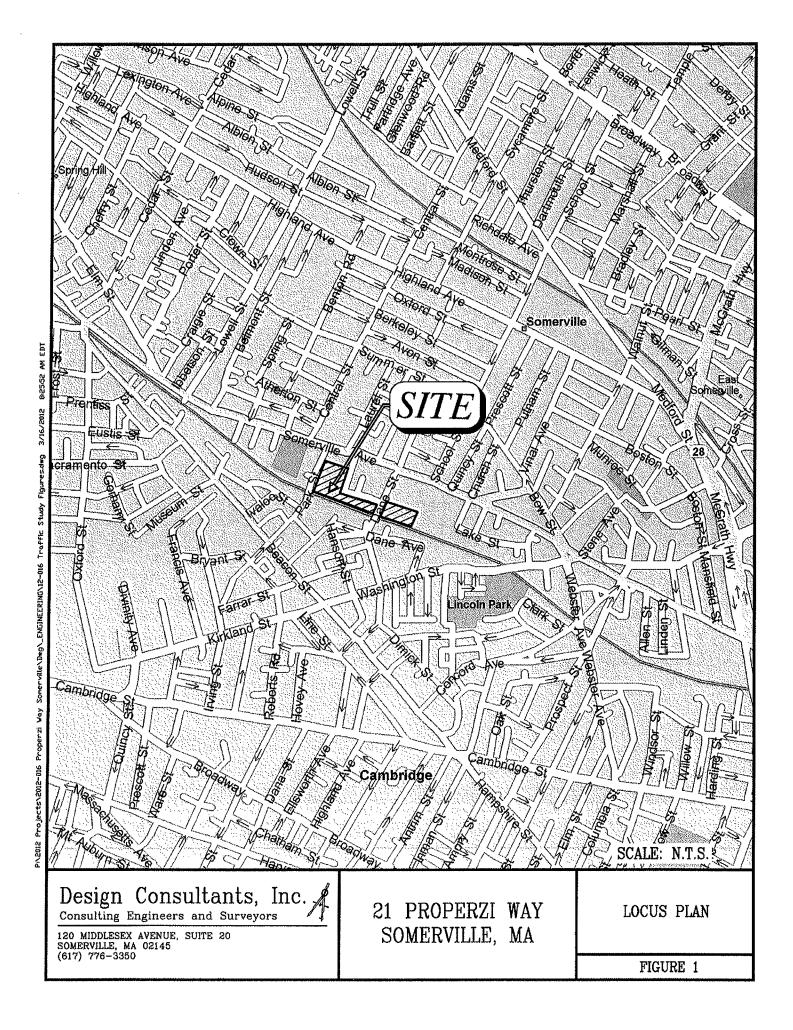
March 29, 2012

This memorandum, prepared at the request of Petra Somerville Inc, the applicant, evaluates the traffic impacts associated with a proposed Rock Climbing/Fitness Center, (herein referred to as the fitness center) to be located in Building #9 at 10 Tyler Street, a/k/a 28 Park Street, owned by JWF, LLC. Institute of Transportation Engineers (ITE) trip generation rates and standard traffic engineering practice and procedures have been used in this traffic assessment.

Building #9 was previously occupied by 43,467 SF of manufacturing use, 6,488 SF of office space and a 3,000 SF gym.

Proposed Development

Petra Somerville, Inc. proposes to construct a 30,480 square foot rock climbing/fitness center in building #9 at 10 Tyler Street a/k/a 28 Park Street. The entrance for the fitness center will be provided off of Properzi Way at Tyler Street. The fitness center will employ 5-10 people and business hour will be from 10 AM-11PM on weekdays and weekends. Bicycle racks for 40 bicycles will be provided inside the facility. Peak business hours are expected to occur from 5 PM -7 PM on weekdays and 11 AM - 3 PM on weekends.



The traffic assessment focused on only the afternoon peak hour as the fitness center will not be open during the morning peak hour.

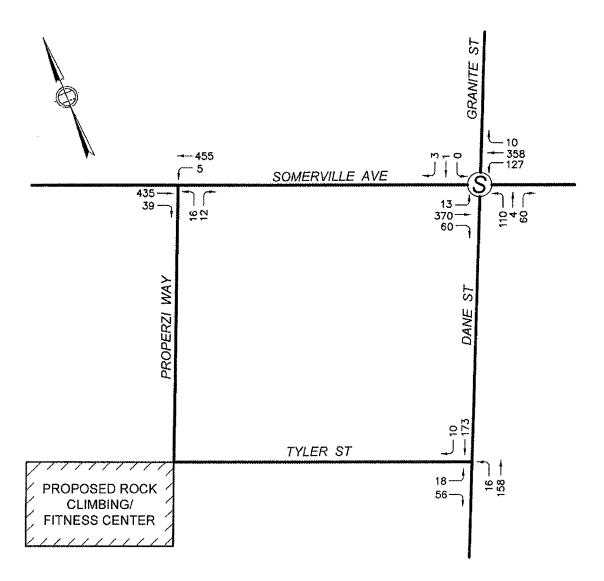
Properzi Way is a 26-foot wide, 2-way street travelling from Tyler Street to Somerville Avenue where it is stop sign controlled. Somerville Avenue at this location is 49 feet wide providing one travel lane in each direction, with bicycle lanes and curbside parking.

Tyler Street is also 26 feet wide travelling east west from Dane Street to Properzi Way is stop sign controlled at its intersections with Dane Street and Properzi Way. Dane Street is 26 feet wide at its intersection with Tyler Street providing one lane in each direction.

Dane Street is a north-south connector street travelling from Somerville Avenue to Washington Street. Dane Street is traffic signal controlled at its intersection with Somerville Avenue and Granite Street. Dane Street and Granite Street provide one lane approaches to their intersection will Somerville Avenue. Somerville Avenue provides one lane for eastbound traffic and a through lane and a left turn lane for westbound traffic.

Traffic Volumes

Manual turning movement counts were record by DCI from 4-6 PM at the study area intersections. The afternoon peak hour occurred from 4:30-5:30 and the PM peak hour volumes are shown below.



Trip Generation/Distribution

DCI has estimated the afternoon peak hour trips generated by the proposed fitness center by using trip rates presented in the ITE Trip Generation Manual.

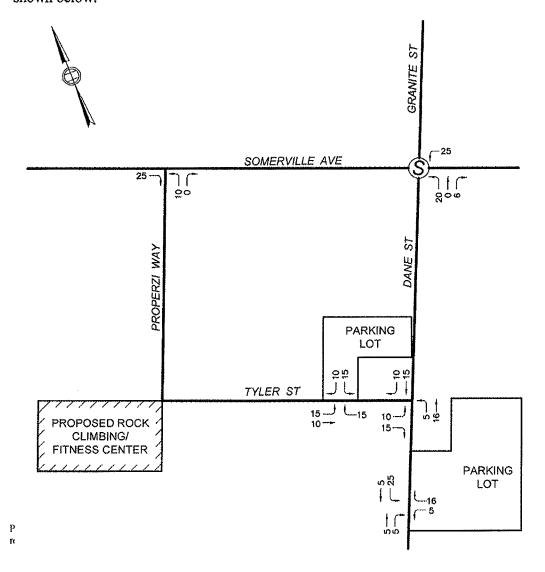
30,480 SF Health/Fitness Club (Land Use 492)

PM Peak Hour

- In 60
- Out 46
- Total 106

Office use of the same space would generate significantly more trips during the AM peak hour and slightly more trips during the PM peak hour.

The site generated PM peak hour trips have been distributed on the study area intersections based upon existing travel patterns and knowledge of the study area and are shown below.



Traffic Impacts

In order to evaluate the traffic impacts of the site generated trips, it is necessary to determine Levels-of Service for existing "No-Build" conditions and "Build" conditions with the new traffic from the fitness center. Level-of-Service is the standard technique used in traffic engineering to determine traffic flows through an intersection with "A" at best with little or no delays to "F" at worst or forced flow conditions. Detailed description of Levels-of-Service is provided in the Appendix.

Highway Capacity Software (HCS) was utilized in the capacity analyses to determine the resultant intersections Levels-of-Service for "No-Build" and "Build" conditions, which are shown in Table A.

As indicated in Table A, all No-Build Levels-of-Service will be maintained under "Build" conditions with only minimal increases in delays.

Therefore the PM peak hour trips generated by the proposed fitness center will have little, if any, impacts on traffic flows at the three study area intersections.

TABLE A LEVEL-OF-SERVICE

NO-BUILD

BUILD

- 17 77 - 1		PM Peak Hour			PM Peak Hour	ır
Location/Movement	V/C(1)	Delay(2)	(c)SO7	A/C	Delay	TOS
Somerville Ave/Properzi Way						
Somerville Ave WB Lts	0	8.4	A	0	8.5	A
Properzi Way Out	0.09	16.5	O	0.13	18.3	၂ ပ
Dane St./Tyler Street						
Dane NB Lts	0.01	7.6	A	0.02	7.7	A
Tyler Street Out	0.11	10.2	В	0.15	10.8	B
Somerville Ave/Dane Street (Signalized)						
Somerville Ave EB	0.59	24.5	ပ	0.59	24.5	O
Somerville Ave WB Lts	0.26	10.5	В	0.31	11.1	B
Somerville Ave WB	0.37	9.6	A	0.37	9.8	¥
Dane St NB	0.59	. 47	۵	0.68	51.3	a
Granite St SB	0.01	33.9	ပ	0.01	33.9	ပ
Overall	0.61	21.6	ပ	99.0	22.7	ပ

(1) Volume/Capacity Ratio (2) Control delay in Seconds (3) Levels-of-Service

APPENDIX

Health/Fitness Club

(492)

Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area

On a: Weekday,

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.

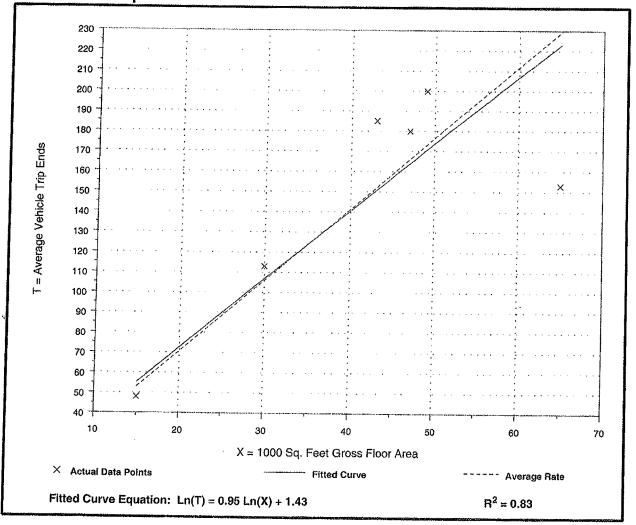
Number of Studies: 6 Average 1000 Sq. Feet GFA: 42

Directional Distribution: 57% entering, 43% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
3,53	2.35 - 4.30	2.00

Data Plot and Equation



		O-WAY STOP						
General Information)		Site I	nforma	tion			
Analyst	WDC		Interse	ection		SOM/PRO	OPERZI	
Agency/Co.	DCI		Jurisd	iction		SOM		
Date Performed	3/1/2012		Analys	sis Year		2012		
Analysis Time Period	PM NB				4			
Project Description 21								
East/West Street: SOM					eet: SOM			
ntersection Orientation:	East-West		Study I	Period (h	rs): 0.25			
Vehicle Volumes an	d Adiustme	nts	i					
Major Street		Eastbound	····			Westbou	ınd	
Movement	1	2	3		4	5		6
	L	Т	R		L	T		R
/olume (veh/h)	0	435	39		5	455		0
Peak-hour factor, PHF	0.90	0.90	0.90		0.90	0.90		0.90
lourly Flow Rate (veh/h)	0	483	43		5	505		0
Proportion of heavy	_			T	0			
ehicles, P _{HV}	0				U			
Median type		-		Undivid	ded			
RT Channelized?			0					0
anes	0	1	0		0	1		0
Configuration			TR		LT			
Jpstream Signal		0				0		
linor Street		Northbound				Southboo	und	
/lovement	7	8	9		10	11		12
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	L	T	R		L	Т		R
/olume (veh/h)	16	i o	12		0	0		0
Peak-hour factor, PHF	0.90	0.90	0.90		0.90	0.90		0.90
iourly Flow Rate (veh/h)	17	0	13		0	0		0
Proportion of heavy					_			^
ehicles, P _{HV}	0	0	0		0	0		0
Percent grade (%)		0				0		
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onfiguration		LR				l		
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olume, v (vph)		5		30				
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'c ratio		0.00		0.09		 		
ueue length (95%)		0.01		0.28				
		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				<del> </del>		
ontrol Delay (s/veh)		8.4		16.5		<del> </del>		
os		A		C			<u> </u>	
pproach delay (s/veh)		**		16.5				
pproach LOS				C				

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	TWC	-WAY STOP	CONTROL	SUMMARY			
General Informati	on		Site Info	rmation			
Analyst Agency/Co. Date Performed Analysis Time Period	WDC DCI 3/2/2012 PM NB		Intersection Jurisdiction Analysis Y	n	DANE/TYL SOM 2012	ER	
Project Description 2	21 PROPERZIE						
East/West Street: TY	LER			th Street: DANI			
Intersection Orientation	n: North-South		Study Peri	od (hrs): 0.25			
Vehicle Volumes a	and Adjustme	nts					
Major Street		Northbound			Southbour	ıd	
Movement	11	2	3	4	5		6
	L	Т	R	<u> </u>	Ī		R
Volume	16	158	0	0	173		10
Peak-Hour Factor, PHF		0.90	0.90	0.90	0.90 192		0.90 11
Hourly Flow Rate, HFR		175	0	0 0	192		
Percent Heavy Vehicle	s 0						<b>+-</b>
Median Type		1		ndivided	T	<del>-</del> 1	0
RT Channelized			0	0	1		0
anes	0	1		<u> </u>			TR
Configuration	LT	0			1 0		IIX
Jpstream Signal						<u> </u>	
/linor Street		Westbound	9	10	Eastbound	<u>,                                      </u>	12
Movement	7	8 -			T		R
	<u>L</u>	Т	R   0	18	0	<del></del> -	56
/olume Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90		0.90
lourly Flow Rate, HFR		0.90	0.90	20	0.90		62
Percent Heavy Vehicles		0	0	1 0	T o	_	0
Percent Grade (%)	·	0		<del>                                     </del>	<u> </u>		
		T N			T N	<u> </u>	<del></del>
lared Approach							
Storage		0			0		
RT Channelized			0				0
anes	0	0	0	0	0		0
Configuration					LR	l	
elay, Queue Length,	and Level of Se						
pproach	NB	SB	Wes	stbound	Ea	stbound	~
/lovement	1	· 4	7	8 9	10	11	12
ane Configuration	LT					LR	
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					+	В	<del>                                     </del>
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pproach Delay							
pproach LOS					<u> </u>	В	

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Extension of green, e	of effective			2.0		2.0	2.0				2.0			2.0	
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ntersection Orientation:	East-West		Study	Period (I	nrs): 0.25			
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Major Street		Eastbound				Westbo	und	
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Project Description 2								· · · · · · · · · · · · · · · · · · ·	
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ntersection Orientation		··········	Study	Period	d (hrs):	0.25		1.134.41	
Vehicle Volumes a	and Adjustm	ents							
Major Street		Northbound	1			JIII. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Southbo	und	
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ercent Heavy Vehicles	s 0				C	)			
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eak-Hour Factor, PHF	0.90	0.90	0.90	)	0.9	90	0.90		0.90
lourly Flow Rate, HFR		0	0		3.	1	0		78
ercent Heavy Vehicles	5 0	0	0		0	)	0		0
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ane Configuration	LT		<b></b>				<u> </u>	LR 100	<del> </del>
(vph)	23				_			109	<b></b>
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			LT	TH	R	T	LT	TH		RT	L	Γ	TH	RT	LT	TH	RT
Number of	lanes, N ₁		0	1	0		1	1		0	0		1	0.	0	1	0
Lane group	)			LTR			L	TR					LTR			LTR	
Volume, V	(vph)		13	370	60	,	152	358		10	130	2	4	66	0	1	3
% Heavy v	ehicles, %H\	/	0	0	0	1	0	0		0	0		0	0	0	0	0
Peak-hour	factor, PHF	······································	0.90	0.90	0.9	0 0	0.90	0.90	7	0.90	0.9	0	0.90	0.90	0.90	0.90	0.90
Pretimed (F	) or actuate	d (A)	P	Р	P		Р	Р		Р	P		Р	P	P	P	P
Start-up los				2.0			2.0	2.0					2.0			2.0	
Extension of green, e	of effective			2.0			2.0	2.0					2.0			2.0	
Arrival type	, AT			3			3	3					3			3	
Unit extens	ion, UE			3.0		<u> </u>	3.0	3.0					3.0			3.0	
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Initial unme	t demand, Q	b		0.0			0.0	0.0					0.0			0.0	
Ped / Bike /	RTOR volui	mes	0		0		0			0	0			0	0		o
Lane width				12.0		1	0.0	11.0		<del></del>			12.0			12.0	
Parking / G	rade / Parkin	g	N	0	N		N	0		N	Ν		0	N	N	0	N
Parking ma	neuvers, N _m								1								
Buses stop	oing, N _B			0			0	0		********			0			0	
Min. time fo G _p	r pedestrians	S,		3.2				3.2					3.2			3.2	
Phasing	WB Only	-	/Perm		03		04	4	_	S Per			06		07		)8
Timing	G = 20.0 $Y = 0$	G = Y =	60.0	G = Y =			3 = / =	······································		= 30. = 5	0	G Y:		G = Y =	***************************************	G = Y =	
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#### DESIGN CONSULTANTS, INC.

Design Consultants Building 265 Medford Street Suite 308 SOMERVILLE, MA 02143 (617) 776-3350 FAX (617) 776-7710

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